

REMARKS

Claims 1-18 and 22 remain in this application. Claims 1, 4, 7, and 9-18 are amended. Claims 19-20 are canceled. Claims 21-22 are new. No new matter is introduced.

Claims 1-18 and 20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended Claims 1, 4, 7, and 9-18, and canceled Claim 19-20. Applicant respectfully submits that the amendments made to the Claims should remove the Examiner's 35 U.S.C. § 112, second paragraph, rejection. No new matter is introduced.

With regard to Examiner's Section 112 rejection to Claim 7, Applicant respectfully submits that since this is an open-ended claim and that the complex compound $[(\eta_5\text{-EDBP})\text{Li}_2]_2[(\eta_5\text{-}^t\text{Bu})\text{Li}(0.5\text{Et}_2\text{O})]_2$ is used merely as one of the many catalysts that can be used in the reaction, Claim 7 has been amended to delete the recitation of this complex compound without affecting patentability. Similar amendment has also been made to Claim 16. No new matter is introduced.

Claims 1, 4-6, and 9-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Zalusky et al. JACS, 2001, 123, 1519-1520; Claims 1, 4-6, and 9-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Choi et al (US 6,210,717); Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Park et al (US 6,517,869).

Applicant has rewritten Claim 1 in the form of a Markush claim to include the limitations of either Claim 2 or Claim 3. Since the art rejections do not apply to Claims 2 and 3, Claim 1 is now allowable after the amendments made to overcome the Examiner's Section 112 rejection as described above. Claims 2-3 are already allowable. Claims 4-9, which depend from Claim 1, as amended, should now also become allowable. A dependent claim should be considered allowable when its parent claim is allowed. In re McCann, 101 U.S.P.Q. 411 (CCPA 1954).

Applicant has similarly rewritten Claim 10 in the form of a Markush claim to include the limitations either Claim 11 or Claim 12. Thus, Applicant respectfully submits, Claim 10 and Claim 11-18, which depend from Claim 10, are also allowable.

With regard to the art rejection, Applicant has added Claim 21 which contains all the elements of the original Claim 1 plus additional elements which recite that the chiral block copolymer is caused to self-assemble into a series of nanohelical microstructures. Applicant believes that the new Claim 21, which indeed is an amended Claim 1, should patentably distinguish from all the prior art references cited by the Examiner. Support for the newly added elements in Claim 21, relative to the original Claim 1, can be found, for example, on page 4, lines 21-30 of the Specification.

To better illustrate some of its key elements, Claim 21 is duplicated below:

Claim 21 (new):

- 1 21. A method for making a series of nanoscale microstructures comprising the steps of:
 - 2 (1) forming a chiral block copolymer containing a plurality of first polymer blocks of
3 first polymers and a plurality of second polymer blocks of second polymers, wherein
4 at least said first polymer blocks are chiral polymer blocks exhibiting chirality, and
5 said first and second polymer blocks are capable of being subject to a micro-phase
6 separation and said first polymer blocks have a volume fraction ranging from 10 to
7 90%;
 - 8 (2) causing a microphase separation in said chiral block copolymer to *self-assemble* into
9 a series of *nanohelical microstructures*.

Applicant respectfully submits that, as described above, one of the key elements of Claim 21

is to take advantage of the newly discovered chiral effect (i.e., which is obtained by including chiral polymer blocks in a block copolymerization process) during the microphase separation of chiral block copolymers, to cause them (i.e., chiral block copolymers) to be self-assembled into *nanohelical* microstructures. Of course, another key element of Claim 21 which is already recited in Claim 1, is that the first and second polymer blocks must be capable of being subject to a microphase separation. This chiral effect, which can be utilized to manufacture self-assembled nanohelical microstructures, was discovered by the co-inventors of the present invention and disclosed in the Specification of the present patent application. Applicant respectfully submits that the invention disclosed in the present patent application is novel and nonobvious, in that no prior art references ever taught or suggested that nanohelical microstructures can be self-assembled utilizing the chiral effect of chiral block copolymers.

With regard to the prior art references cited by the Examiner, Applicant respectfully submits that the Zalusky et al. reference (JACS, 2001, 123, 1519-1520) taught the use of poly (D, L-lactide) polymer block. By definition, the (D, L-lactide) polymer block is a non-chiral polymer (because it contains both D and L). This distinguishes from Claim 21, which recites that at least the first polymer blocks must be chiral polymer blocks. Furthermore, the Zalusky et al reference never shows that a nanohelical microstructure can be produced. On the other hand, while the Choi et al (US 6,210,717) and the Park et al (US 6,517,869) references taught the formation of chiral block copolymers, none of them taught or suggested that nanohelical microstructures can be produced from their processes, rendering both references clearly distinguishable from the present invention.

Applicant would like to respectfully submit that it has been clearly established that "anticipation can only be established by a single prior art reference which discloses each and every element of the claimed invention". Structural Rubber Prod. Co. v. Park Rubber Co. 223 USPQ 1264 (Fed. Cir. 1984). It has been held by the Federal Circuit that in order "[f]or a prior-art reference to anticipate, every element of the claimed invention must be *identically* shown in a single reference" (*emphasis added*). In re Bond, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). More recently the Federal Circuit reiterated that "a rejection for anticipation under section 102 requires that each and every

limitation of the claimed invention be disclosed in a single prior art reference". In re Paulsen, 31 USPQ 2d 1671 (Fed. Cir. 1994).

As discussed above, Applicant respectfully submits that Claim 21 indeed recites elements that are not disclosed in any of the prior art references cited by the Examiner. Thus, Applicant would greatly appreciate it if the Honorable Examiner could favorably reconsider the patentability of Claim 21.

In light of the foregoing, it is believed that the present invention is in condition for allowance. And Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If the Examiner has any question, he or she is invited to call or fax Applicant's counsel at the telephone numbers below.

Respectfully Submitted,



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Date

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